Prevention and control of hepatitis C in PWID

Prof. Cathy Matheï

KU Leuven

Free Clinic

outline

- What is the size of the problem?
- What needs to be done?
- Where do we stand now?
- Conclusion

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Size of PWID population

- No data
- Improved application of HIV/AIDS BM method to estimate ever-injectors in 2010
  - Benchmark: HIV/AIDS register
  - Multiplier: sero-behavioral study 2004-5 among 1005 drug users in treatment and 117 incarcerated drug users (15–40 years) enrolled at 65 different drug treatment facilities and 15 different prisons geographically dispersed over Belgium
- No significant time trends were observed for the period 2000–2010.

Bollaerts et al. Archives of Public Health 2013

Subject to methodological

Size of PWID population

Estimation of ever injecting drug use and current injecting drug use in 2010

	Prevalence/ 1000 aged 15-64 (95% CI)	Number
Ever injecting drug use	3.5 (2.5-4.8)	24664
Current injecting drug use	1.4 (1.02-1.97)	10110

Bollaerts et al. Archives of Public Health 2013.
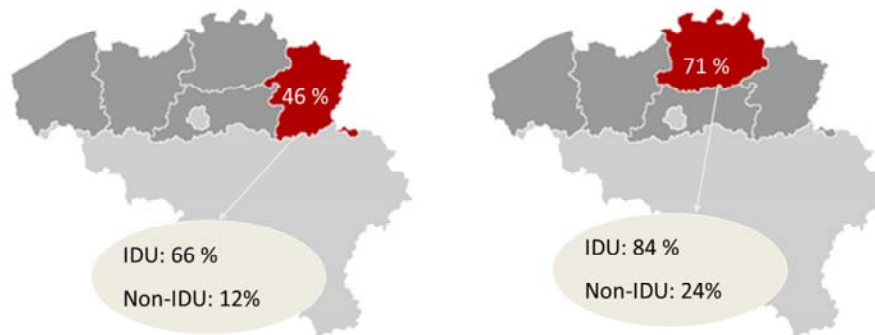
Prevalence of HCV in PWID

- National sero-behavioral study conducted in 2005
- N= 1122 PWUD

Population	Prevalence %
PWUD	30%
Ever IDU	50%
PWID reporting sharing	61%
PWID in prison	76%
PWID in prison reporting sharing	86%

Plasschaert et al. Study on HCV, HBV and hHIV seroprevalence in a sample of drug users in contact with treatment centres or in prisons in Belgium, 2004-2005

Seroprevalence study: HIDA study

Conducted in 2000
N=310

46 %

71 %

IDU: 66 %

Non-IDU: 12%

IDU: 84 %

Non-IDU: 24%

Matheï et al. Epidemiol Infect 2005.

Wit respect to the serology again some important differences were found. In the total population of drug users, the prevalence of HCV was respectively 46 % in Limburg and 71 % in Antwerp. When only IDU are considered these differences become even more pronounced..
As I already said in the second part of the analysis we investigated how characteristics and behaviour related to positive HCV serology. I will only discuss the results of the multivariate analysis which we did for the whole population of drug users and for IDU separately.

Some of the identified independent predictors for positive HCV serology are similar to those frequently reported in previous studies more specifically IDU, sharing and duration of IDU. Within the group of IDU also poly-drug use came out as an independent predictor for HCV infection. Also frequently reported as independent predictor is the presence of anti-HBc, reflecting diseases are subject to similar dynamics.

In studies concerning the prevalence of HCV in IDU often a number of sexual risk factors are crudely associated with HCV prevalence, but these associations tended to disappear in multivariate analysis. In this study having worked as a commercial sex-worker was retained as a independent predictor for HCV seroconversion. However this relation disappeared when only injectors were considered. It seems that the importance of sexual transmission in the population of injectors is limited since HCV is far more effectively transmitted by parenteral route. On the other hand in non-injectors sexual transmission could be a major transmission route responsible for the higher prevalence rates of HCV when compared to the general population.

A significant finding in this study included the relation between socio-economic factors and positive HCV serology. In univariate analysis unemployment, low level of education loose social network and marginalization were found to be related with hepatitis C infection. In multivariate analysis only marginalization when considering all DU and unemployment when considering only IDU were retained as independent predictors

Finally, having a Northern African or a Middle Eastern nationality revealed to be strong predictors for HCV infection, while this relation was not apparent in univariate analysis. We have thought of 2 possible explanations for this finding. First of all it could be that IDU is more taboo within these ethnic groups and that are less likely to admit these practises. Another hypothesis conidrs higher background prevalences within people originating from Northern Africa or the Middle East resulting in higher prevalence rates before starting drug use.

Mitigating the burden of hepatitis C virus among people who inject drugs in Belgium

Catharina Matheï[1], Stefan Bourgeois[2], Sarah Blach[3], Christian Brixko[4], Jean-Pierre Mulkay[5], Homie Razavi[3], Geert Robaeys[6,7,8]

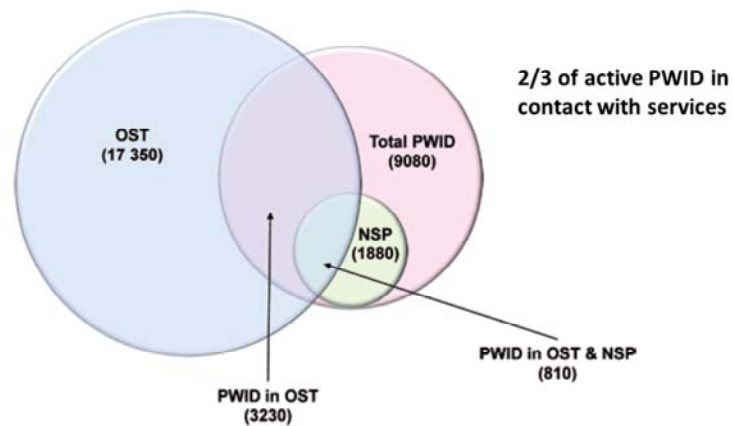Fig. 1. — Size of the OST, NSP and PWID populations, 2015

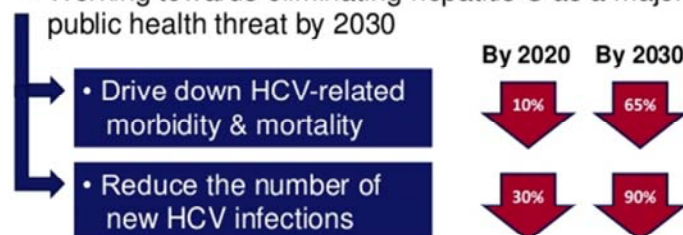Mathei C. et al. ActaGastro-Enterologica Belgica 2016.

outline

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Public Health England

The WHO goal of elimination…

- World Health Organisation's (WHO) Global Health Sector Strategy (GHSS) on Viral Hepatitis, 2016-2021*
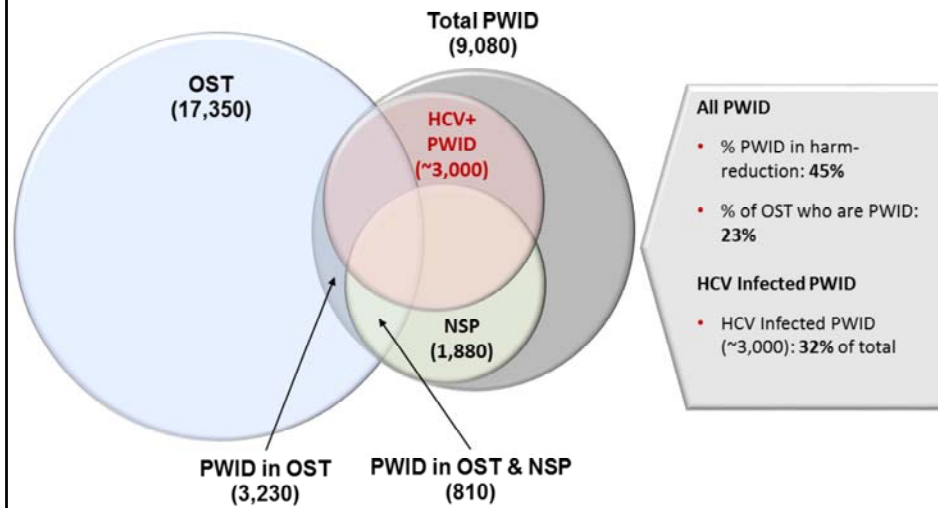 - Working towards eliminating hepatitis C as a major public health threat by 2030

	By 2020	By 2030
• Drive down HCV-related morbidity & mortality	10%	65%
• Reduce the number of new HCV infections	30%	90%

* http://www.who.int/hepatitis/strategy2016-2021/Draft_global_health_sector_strategy_viral_hepatitis_13nov.pdf?ua=1
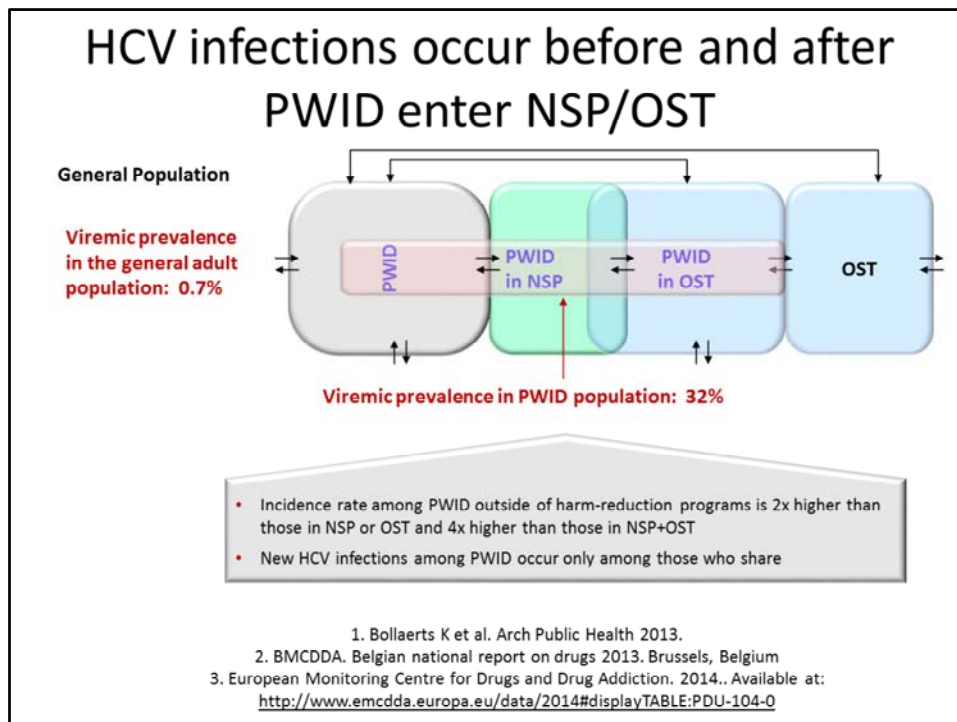
PWID transmission model

- Objectives:

  - Develop a simple model to estimate the number of new HCV infections using available data on key risk groups.

  - Examine the impact of intervention strategies (prevention & treatment) on new infections and total infections.

- Focus on PWID who are currently injecting as this is the population at risk of transmitting HCV or becoming infected

PWID in OST and/or NSP in 2015

Total PWID (9,080)

OST (17,350)

HCV+ PWID (~3,000)

NSP (1,880)

PWID in OST (3,230)

PWID in OST & NSP (810)

All PWID
- % PWID in harm-reduction: 45%
- % of OST who are PWID: 23%

HCV Infected PWID
- HCV Infected PWID (~3,000): 32% of total

Mathei C.et al. ActaGastro-Enterologica Belgica 2016.

3/14/16

HCV infections occur before and after PWID enter NSP/OST

General Population

Viremic prevalence in the general adult population: 0.7%

PWID

PWID in NSP

PWID in OST

OST

Viremic prevalence in PWID population: 32%

- Incidence rate among PWID outside of harm-reduction programs is 2x higher than those in NSP or OST and 4x higher than those in NSP+OST
- New HCV infections among PWID occur only among those who share

1. Bollaerts K et al. Arch Public Health 2013.
2. BMCDDA. Belgian national report on drugs 2013. Brussels, Belgium
3. European Monitoring Centre for Drugs and Drug Addiction. 2014.. Available at:
http://www.emcdda.europa.eu/data/2014#displayTABLE:PDU-104-0

PWID were modeled to move across segments in a limited number of directions. Behavior changes resulting in injecting or in a discontinuation of injecting could occur, or PWID could move into or out of NSP and OST. Additionally, PWID who share needles and were previously not infected with HCV could become infected. And finally, PWID who were HCV infected (regardless of sharing behaviors) could be cured of their HCV
through treatment with antivirals. PWID exited the model due to mortality (annual rate of 2% assumed for Belgium based on analog data from Luxembourg and expert consensus) or cessation of injection drug use.

In the absence of treatment, the HCV infected PWID population will decrease 10% over the next 15 years
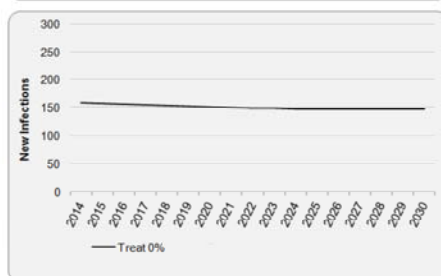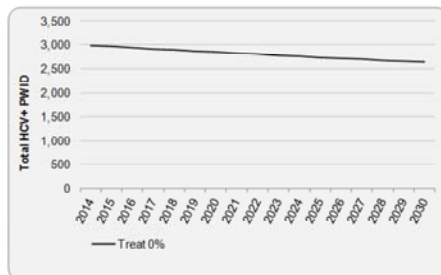
- In the absence of treatment or expanded harm reduction efforts, the HCV infected PWID population will decrease 10% over the next 15 years as the population ages

- The number of new infections will decrease 7%

Mathei C.et al. ActaGastro-Enterologica Belgica 2016.

The model was run

In the absence of behavioral changes, the number of secondary infections will increase with a low level of treatment of 1%
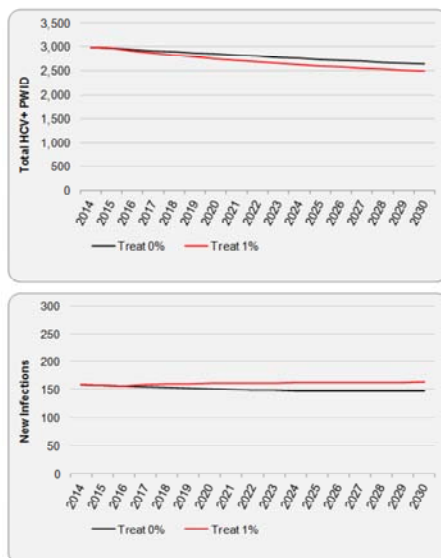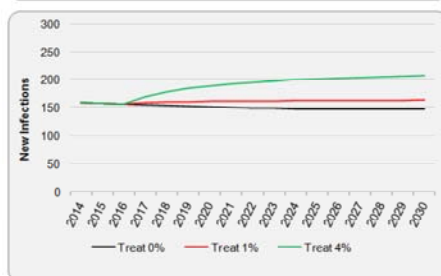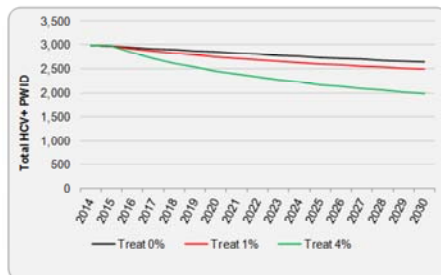
- Treatment of 1% of the PWID population, or approximately 30 PWID annually, would reduce total infections by 5%

- New infections, would increase 10%, with a maximum of 20 secondary infections per year, by 2030

Mathei C.et al. ActaGastro-Enterologica Belgica 2016.

Treat at low level, will see small increases in secondary infections as PWID are re-exposed to HCV in their injecting networks

In the absence of behavioral changes, the number of secondary infections will increase with a low level of treatment of 4%

- Treatment of 4% of the PWID population, or approximately 120 PWID annually, would reduce total infections by 25%

- New infections, would increase 40%, with a maximum of 70 secondary infections per year, by 2030

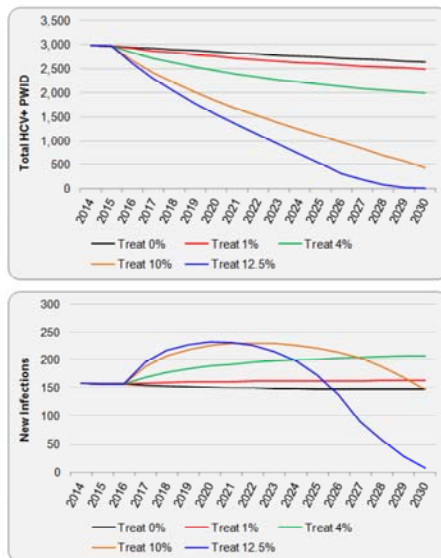Mathei C.et al. ActaGastro-Enterologica Belgica 2016.

If the viral pool is depleted (HCV prevalence near zero), the number of new infections will decline (10% treated)
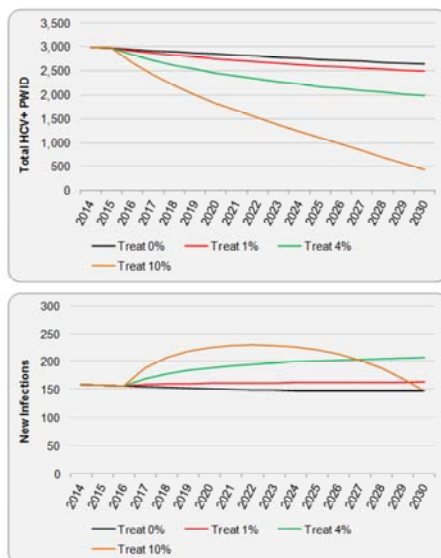
- Treatment of 10% of the PWID population, or approximately 295 PWID annually, would reduce total infections by 85%

- New infections, would increase 45% by 2022, with a maximum of 119 secondary infections per by 2024

- By 2030, new infections would be the same as in a strategy with no treatment

Mathei C.et al. ActaGastro-Enterologica Belgica 2016.

Rapid depletion of the viral pool will cause new infections to nearly vanish (12.5% treated)

Total HCV+ PWID

3,500 · 3,000 · 2,500 · 2,000 · 1,500 · 1,000 · 500 · 0

2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

— Treat 0% — Treat 1% — Treat 4%
— Treat 10% — Treat 12.5%

- Treatment of 12.5% of the PWID population, or approximately 370 PWID annually, would reduce total infections by nearly 100%

- New infections, would increase 45% by 2020, with a maximum of 125 secondary infections per year in 2022

- By 2030, new infections would decrease by 95% compared with no treatment

New Infections

300 · 250 · 200 · 150 · 100 · 50 · 0

2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

— Treat 0% — Treat 1% — Treat 4%
— Treat 10% — Treat 12.5%

Mathei C.et al. ActaGastro-Enterologica Belgica 2016.

Aggressive initial treatment of 370 PWID annually resulting in rapid depletion of the viral pool would actually move forward the tipping point for secondary infections.

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The case of Free Clinic

- \> 15 years HCV management
- Development of a hepatitis C care pathway involving a multidisciplinary team
  - Hepatologist
  - MSOC
  - NSEP
  - Hepatitis C nurse
  - Hepatitis C buddies since 2015

The case Free Clinic

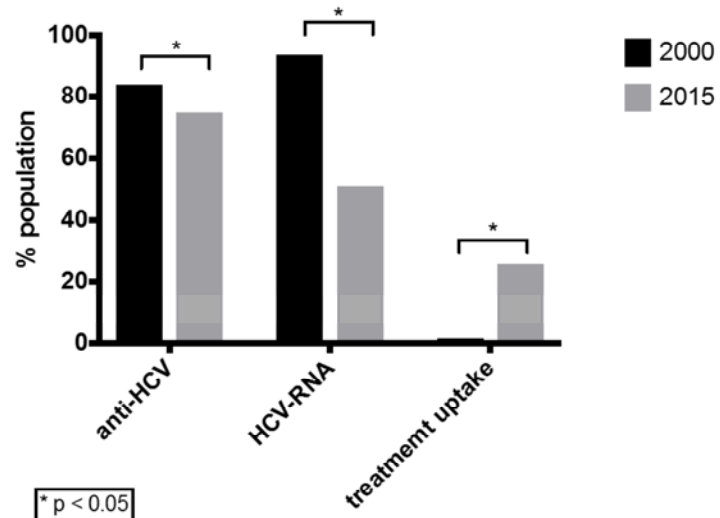## Hepatitis C continuum of care

| Diagnosis | Linkage to care | Treatment | Prevention of reinfection |

Treatment uptake in the DAA era

- Shift towards more chaotic/problematic PWID
  - Unstable living conditions
  - Poor physical and/or mental health
  - Alcohol abuse
  - No health insurance
  - ...
- Annual treatment uptake currently >10%

Challenges

- In many drug treatment centers HCV management limited to screening/diagnosis
- TDI-IMA databank

  PWID entering treatment between 2011-2014 (N=3352)

  Testing/diagnosis 2008-15

	PCR	Genotyping
85%	34%	50%

Challenges

- Poor referral rates and treatment uptake
  - 40-50 patients treated annually
  - annual treatment uptake: < 0.05%
  - Cumulative treatment uptake: < 0.2%

Challenges

- Quid PWID not in treatment?

➔ Need for expansion of harm reduction measures

Conclusion

- Achievement of WHO goals among PWID in Belgium will require sufficient commitment of all stakeholders and mobilization of resources